Ordering number: EN 1187E

Monolithic Linear IC



No.1187E

LA5000 Series

2 to 5V 60mA Low Saturation Voltage Regulators

The LA5002, 5003, 5004, 5005 are voltage regulators having a small input-output voltage drop (0.2V typ.) They are especially suited for use in battery-powered low voltage equipment and commercial or industrial equipment having a large voltage regulation.

Features

- Small input-output voltage drop (0.2V/I_{OUT}=20mA typ.)
- Minimum number of external parts required
- Highly resistant against load short
- Radio noise (radiation) control pin

Maximum Ratings at Ta=25°C

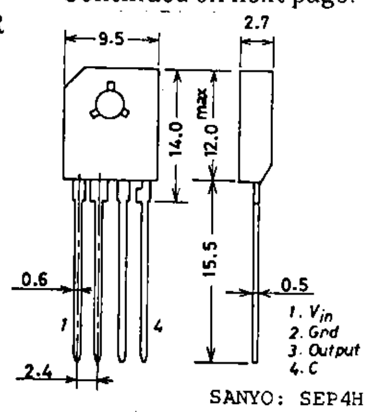
				unit
Input Supply Voltage	V_{IN} max		12	V
Output Current	I_{OUT} max		60	mA
Allowable Power Dissipation	Pd max	Ta=80°C	560	mW
Operating Temperature	Topr		−20 to +80	°C
Storage Temperature	Tstg		−30 to +125	°C

Electrical Characteristics at Ta=25°C, C_{OUT}=10μF, I_{OUT}=20mA, V_{IN}=3V[LA5002], V_{IN}=4V [5003], V_{IN}=5V [LA5004], V_{IN}=6V [LA5005]

			min	typ	max	unit
Output Voltage	V_O	LA5002	1.85	2.0	2.15	V
		LA5003	2.8	3.0	3.2	V
		LA5004	3.75	4.0	4.25	V
		LA5005	4.75	5.0	5.25	V
Line Regulation	V_O line	LA5002: 2.5V<V_{IN}<8V			50	mV
		LA5003: 3.5V<V_{IN}<9V			50	mV
		LA5004: 4.5V<V_{IN}<10V			50	mV
		LA5005: 5.5V<V_{IN}<11V			50	mV
Load Regulation	V_O load	1mA<I_{OUT}<40mA			20	mV
		1mA<I_{OUT}<50mA			25	mV
Quiescent Current	I_{CCO}	LA5002		1.2	2.0	mA
		LA5003		1.4	2.0	mA
		LA5004		1.5	2.3	mA
		LA5005		1.7	2.5	mA

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Package Dimensions 3027A-S4HTR
(unit: mm)

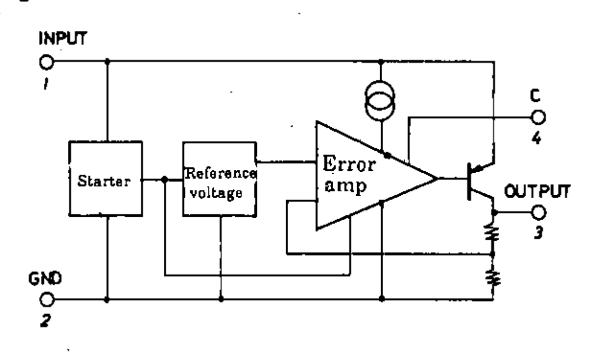


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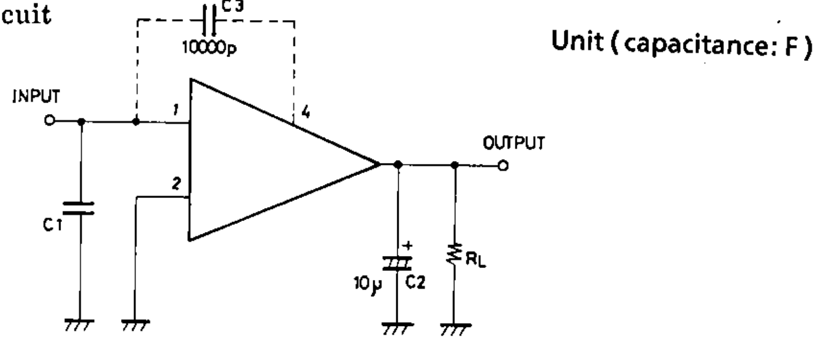
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			min	typ	max	unit
Ripple Voltage	R_r	LA5002,LA5004,LA5005: f=120Hz	40			dB
		LA5003: f=120Hz	43			dB
Input/Output Voltage Drop	V_{drop}			0.2	0.3	V
Coefficient of	$K\Delta v_o/\Delta T$		−1		+1	mV/°C
Output Voltage	V_N	10Hz<f<100kHz		30		μV

Equivalent Circuit Block Diagram



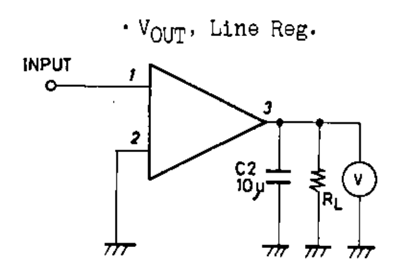
Sample Application Circuit

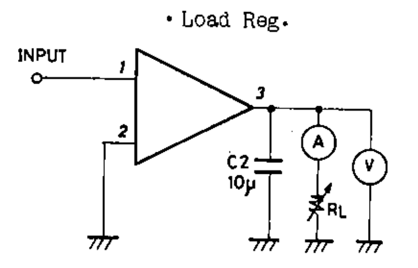


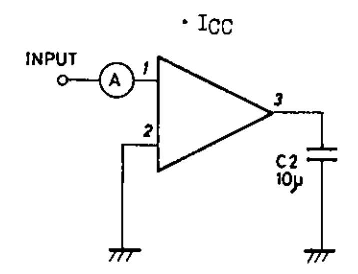
Unit (capacitance: F)

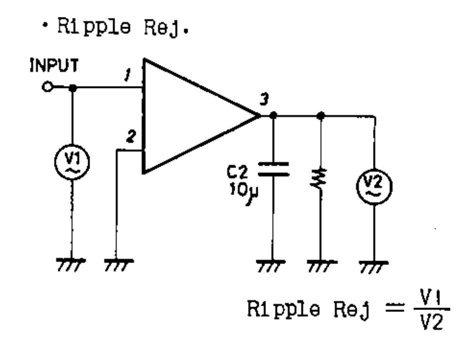
Note: Capacitor C3 is not required unless radio noise is a problem.

Test Circuits



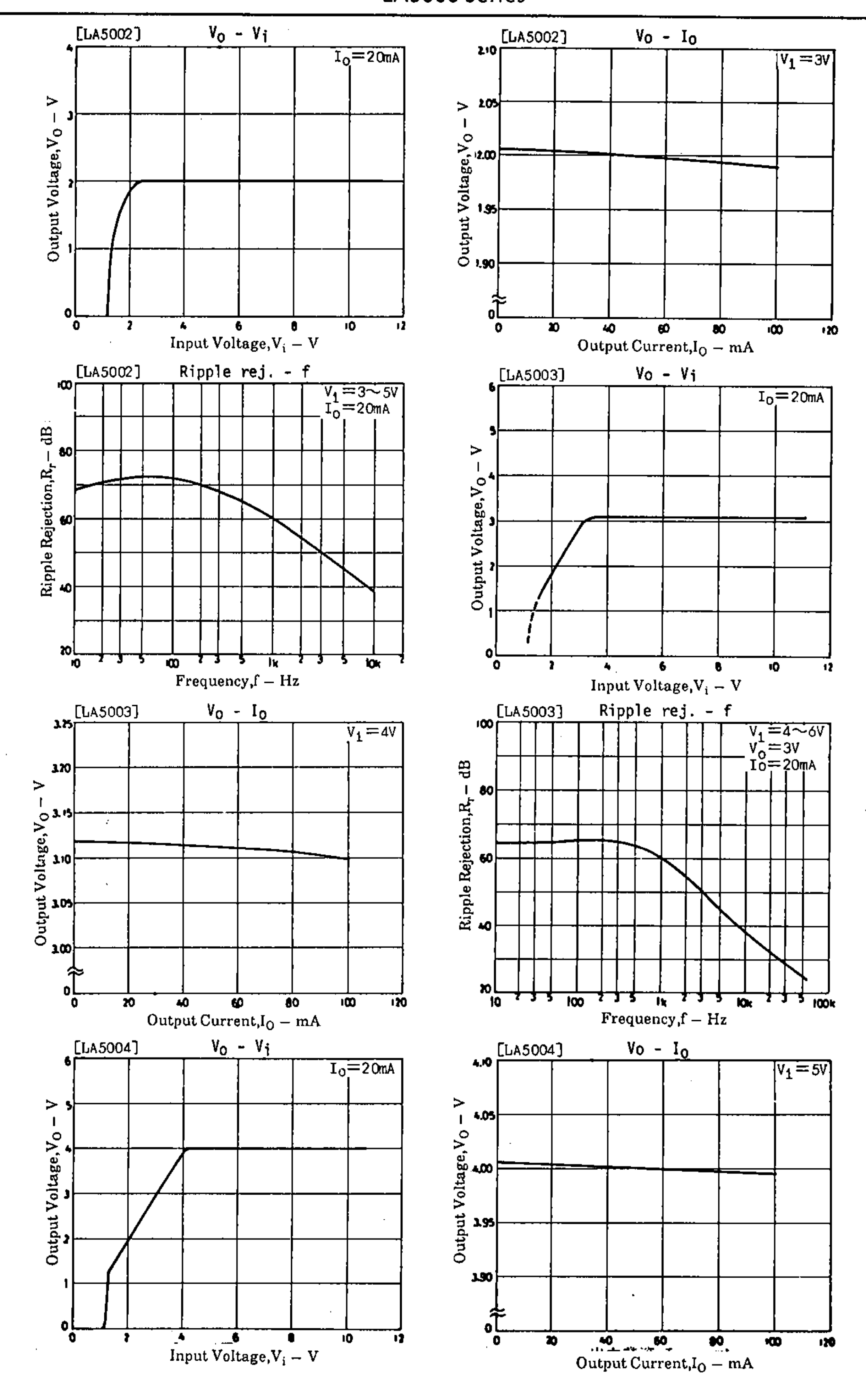


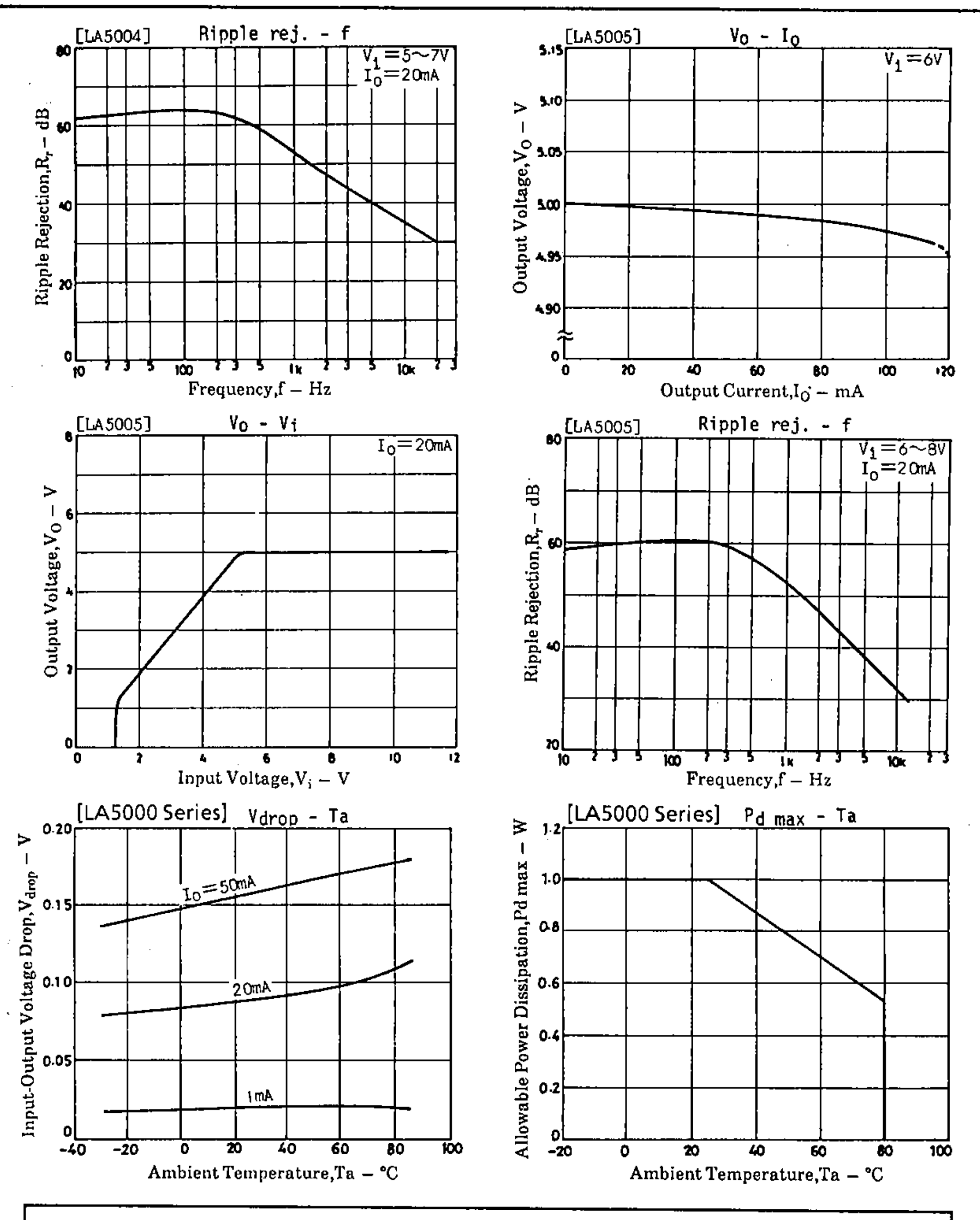




Ripple Rej $= \frac{V1}{V2}$

Unit (capacitance: F)


[LA5002] V_O - V_i
I_O=20mA
Output Voltage,V_O – V
Input Voltage,V_i – V
[LA5002] V_O - I_O
V_1=3V
Output Voltage,V_O – V
Output Current,I_O – mA
[LA5002] Ripple rej. - f
V_1=3~5V
I_O=20mA
Ripple Rejection,R_r – dB
Frequency,f – Hz
[LA5003] V_O - V_i
I_O=20mA
Output Voltage,V_O – V
Input Voltage,V_i – V
[LA5003] V_O - I_O
V_1=4V
Output Voltage,V_O – V
Output Current,I_O – mA
[LA5003] Ripple rej. - f
V_1=4~6V
V_O=3V
I_O=20mA
Ripple Rejection,R_r – dB
Frequency,f – Hz
[LA5004] V_O - V_i
I_O=20mA
Output Voltage,V_O – V
Input Voltage,V_i – V
[LA5004] V_O - I_O
V_1=5V
Output Voltage,V_O – V
Output Current,I_O – mA


[LA5004] Ripple rej. - f
V_1=5~7V
I_O=20mA
Ripple Rejection,R_r – dB
Frequency,f – Hz
[LA5005] V_O - I_O
V_1=6V
Output Voltage,V_O – V
Output Current,I_O – mA
[LA5005] V_O - V_I
I_O=20mA
Output Voltage,V_O – V
Input Voltage,V_i – V
[LA5005] Ripple rej. - f
V_1=6~8V
I_O=20mA
Ripple Rejection,R_r – dB
Frequency,f – Hz
[LA5000 Series] V_{drop} - Ta
I_O=50mA
20mA
1mA
Input-Output Voltage Drop,V_{drop} – V
Ambient Temperature,Ta – °C
[LA5000 Series] Pd max - Ta
Allowable Power Dissipation,Pd max – W
Ambient Temperature,Ta – °C